New Zealand Curriculum

Phase 2 Year 5 with Numicon 4

Numicon is a proven approach to teaching and learning designed to give children the understanding of mathematical ideas and relationships that is essential for successful reasoning and problem-solving. The use of apparatus builds children's mental image of abstract concepts, and helps to develop their understanding of the connections between different areas of mathematics. The resources cover the key mathematical ideas for processes in mathematics: number, measures, shape, space and data that are essential foundations for further mathematical thinking.

We have correlated focus activities from *Number, Pattern and Calculating 4* and *Geometry, Measurement and Statistics 4* to the Mathematics and the New Zealand Curriculum to support teachers in their planning. These correlations will be useful whether schools choose to follow the focus activities in the order outlined in the Teaching Resource Handbook, or prefer to dip in and out of the teaching materials for different topics.

The **Numicon Approach** fulfils the curriculum to students in a knowledge-rich environment where the concepts are taught alongside the processes of being a mathematician. Where you see references to processes, these are embedded in the learning experiences every week:

- The use of representations to communicate with self and others
- Connections within maths and the daily life of the students
- Investigations
- Generalising
- Explain and justify

Included in the Numicon programme is the strong connection with the language of maths. Every week teachers are provided with a list of words and terms to use in their teaching through meaning and usage. There is an expectation that these words are used by the teachers, displayed on walls. Students are encouraged to use these words and terms with confidence. Every week an assessment goal is the 'use of the words and terms in conversation and effectively in discussion'. For example: Numicon 4 Pattern & Algebra 1: Developing fluency with adding and subtracting to 10.

Terms for children to use
multiple, term, ordinal number words (e.g. first, second, third), interval, constant difference, sequence, increasing sequences, decreasing sequences, ones-digit pattern, rule, scale

Teaching Materials Featured in this Correlation:

Number, Pattern and Calculating 4 Teaching Pack ISBN 978-0-19-838984-2
Geometry, Measurement and Statistics 1 Teaching Pack ISBN 978-0-19-838985-9

2024 Curriculum Phase 2 Year 5 with Numicon 4

Abbreviations: Numicon (N) Pattern & Algebra (P&A) Numbers and the Number System, (NNS), Calculating (C), Geometry (G), Measurement (M), Statistics and Probability (*throughout all the strands*) Preparing for Formal Testing (PFT)

Number **Mātauranga tau | Number structure** recognise the base ten structure of numbers up to 100,000	**NNS 1** **To 10, 000** **Numicon 5 NNS 1** **To 1, 000,000**
identify, read, write, compare, and order whole numbers up to 100,000	**NNS 1** **Numicon 5 NNS 1** **To 1, 000,000**
identify factors of numbers up to 100	**P & A 4**
Use mathematical processes to: – connect with metric units that are powers of 10, and with decimal place value – investigate factors and multiples	**The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.**
Operations use rounding and estimation to predict and to check the reasonableness of calculations	**NNS 3**
round whole numbers to a specified power of 10, round tenths and hundredths to the nearest whole number	**NNS 3, 6**
add and subtract whole numbers up to 10,000	**CAL 1 – 4, 8, 9**
multiply a 3-digit by 1-digit number Multiply a two 2-digit whole numbers (e.g., 6 × 248; 37 × 84)	**CAL 12**
divide whole numbers by a 1-digit divisor, Dividing with a remainder (e.g., 83 ÷ 5 = 16, remainder 3)	**CAL 13**
– connect multiplication and division with proportional reasoning – generalise the use of inverse operations and the commutative and distributive properties, to check findings – investigate comprehending and solving word problems, deciding which operation to use and why – explain and justify findings, by connecting to estimates and other checking methods	**The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.**
Rational Number	**NNS 6, 7, 8**

identify, read, write, and represent tenths and hundredths as fractions and decimals	
compare and order tenths and hundredths as fractions and decimals, and convert decimals to fractions	**NNS 8**
divide whole numbers by 10 and 100 to make whole numbers divide whole numbers by 10 and 100 to make decimals	**Cal 7, 12**
for fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, or 100: – compare and order the fractions – identify when two fractions are equivalent – represent the fractions in their simplest form	**NNS 7**
convert between improper fractions and mixed numbers for fractions with denominators up to 10	**Numicon 5**
find a fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g., 2/3 of 24)	**NNS 7, CAL 11**
identify, from a fractional part of a set, the whole set	**NNS 7**
add and subtract fractions with the same denominators, including to make more than one whole	**NNS 5**
add and subtract decimals to two decimal places	**NNS9**
use known multiplication facts to scale a quantity	**Cal 5, 6, 7, 12**
use the mathematical processes to: – connect equivalent fractions and decimals – connect decimal place value and operations with whole number place value and operations – connect decimals with measurement – investigate appropriate situations – explain and justify equivalent fractions – convert between mixed numbers and improper fractions – generalise that multiplying or dividing a number by a power of ten changes the position of the digits on a PV chart (years 5–6)	**The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.**
Financial Maths represent money values in multiple ways using notes and coins	**Numicon 1 – 3** **Measurement 2**
estimate the cost to the nearest dollar of items costing dollars and cents, and the change from the nearest ten dollars	**Measurement 2**
use the mathematical processes to: – connect to rounding and addition and subtraction of decimals to two places – investigate making amounts of money, using different denominations – investigate financial plans and decisions.	
Taurangi | Algebra **Generalising Number Properties** use inverse operations to solve multiplication and division problems	**P & A 2, Cal 7, 11**
	P & A 3
recall multiplication facts to 10 × 10 and corresponding division facts	**CAL 5, 6**

explore the distributive property of multiplication over addition and subtraction (e.g., 6 × 18 = 6 × (20 – 2) = (6 × 20) – (6 × 2)	**P & A 3** **Cal 10, 11, 12**
use the mathematical processes to: – generalise multiplication problems beyond recalled facts, by looking for patterns – investigate patterns in the multiples of times tables	**P & A 4, 5**
form and solve true or false number sentences and open number sentences involving all four operations (e.g., 674 + 56 – k = 671)	**P & A 3**
use tables to recognise the relationship between the ordinal position and its corresponding element in a growing pattern, develop a rule in words, and predict further elements in the pattern	**P & A 1, 5, 7**
use the mathematical processes to: – investigate inverse operations to find missing numbers in equations and growing patterns (e.g., tivaevae) – explain and justify the relationship between the ordinal position and its corresponding element to find a pattern's rule.	
Equations and Relationships create and use algorithms for making decisions that involve clear choices (e.g., formulating a familiar routine as a set of step-by-step instructions)	**P & A 1, 3, 7** **Cal 14** **Measurement 6**
use the mathematical processes to: – connect to algorithms for operations – investigate situations that involve making decisions.	
Measurement **Measuring** estimate and then accurately measure length, mass (weight), capacity, temperature, and duration, using appropriate metric units or a combination of units	**Measurement 3 Length** **Measurement 4 Mass** **Measurement 4 Capacity and volume**
use the appropriate unit and tool for the task and the attribute being measured	**Measurement 3, 4**
use the metric measurement system based on powers of ten to explore relationships between units, including benchmark fractions and decimals	**Measurement 3, 4** **NNS 6, 8**
use the metric measurement system based on powers of ten to explore relationships between units, including benchmark fractions and decimals	**NNS 6** **Measurement 3, 4**
use the mathematical processes to: – connect measuring with place value and decimals, angles with fractions of a circle and degrees of turn, and benchmark fractions with measurements (e.g., 500ml = 21 L) – investigate, using practical measuring situations (e.g., using scaled measurement instruments, reading angles using geometric software and protractors) – explain and justify the use of appropriate metric units for a given situation	
Perimeter, Area, and Volume visualise, estimate, and calculate: – the perimeter of polygons – the area of shapes covered with squares or partial squares – the volume of rectangular prisms, taking note of layers and stacking	**Measurement 6** **Numicon 6?** **Stacking?**

use the mathematical processes to: – connect area with multiplication arrays and the commutative property of multiplication – generalise the formula for finding the area and volume of rectangles and rectangular prisms – investigate practical contexts for finding perimeter, area, and volume	
Time describe the differences in duration between units of time (e.g., days and weeks, months and years)	**Numicon 1 – 3** **Measurement 1**
solve duration-of-time problems involving 'am' and 'pm' notation	**Numicon 3** am/pm **Measurement 1**
use the mathematical processes to: – connect units of time to fractions – investigate calendars, timetables, and schedules to work out the duration between events, or the start and end times for events.	
Geometry **Shapes** identify, classify, and describe the properties of: – regular and irregular polygons, using edges, vertices, and angles – prisms, using the cross section, faces, edges, and vertices	**Geometry 1, 2, 3**
identify and describe parallel and perpendicular lines, including those forming the sides of polygons	**Geometry 1**
use the mathematical processes to: – connect angles with turns – investigate the properties of triangles and polygons – investigate line and rotational symmetry – explain and justify whether lines are parallel, and shapes are regular – explain and justify the value of unknown angles in triangles and quadrilaterals	
Spatial Reasoning visualise and connect 3D shapes with their nets, their 2D diagrams, verbal descriptions of them, and the same shapes drawn from different perspectives	**Numicon 5**
resize a 2D shape so that it is either bigger or smaller	**Numicon 5**
use the mathematical processes to: – connect enlargement with simple grid references or coordinates and with doubling and halving – generalise the properties of shapes that do not change when transformed – investigate nets that fold together, shapes that tesselate, and transformations	

Pathways interpret and create a grid map to plot positions and pathways, using grid references and directional language, including the four main compass points	**Numicon 3 compass points** **Geometry 4**
use the mathematical processes to: – connect compass points with angles and turns, and grid references with graphing skills – investigate different types of maps.	investigate different types of maps.
Statistics **Problem** investigate summary and comparison situations with categorical and discrete numerical data, using multivariate data by – posing summary and comparison investigative questions that can be answered with data – making predictions or assertions about expected findings	**Measuring 1, 2, 3** **Geometry 1 activity 4**
use the statistical processes to investigate school-related issues of interest	
Plan plan how to collect primary data to support answering an investigative question, including: – deciding on the group of interest – deciding the variable(s) for which data will be collected – taking account of ethical practices in data collection	**Measuring 1, 2, 3**
use the statistical processes to: – investigate topics of interest – explain and justify primary and secondary data, sensitive topics or questions, and ethical practices for data collection and use	
Data use a variety of tools to collect data, check for errors in the data, and correct errors by re-collecting the data, if possible	**Measuring 1, 2, 3**
use the statistical processes to investigate methods for collecting secondary data	
Analysis create and describe data visualisations for summary and comparison investigations that make meaning from the data, with statements including the names of the variable and group of interest	**Measuring 1, 2, 3**
use the statistical processes to: – investigate appropriate situations – explain and justify using 'I notice' statement about data visualisations, selecting the visualisation that best represents the data	
Conclusion answer the investigative question, comparing findings with initial predictions or assertions and their existing knowledge of the world	**Measuring 1, 2, 3**
use the statistical processes to: – connect statements with data visualisations to answer an investigative question, and to connect initial predictions or assertions with actual findings – investigate appropriate situations	
Statistical Literacy check and, if needed, improve the statements others make about data, including data from two or more sources.	**Measuring 1, 2, 3**

use the statistical processes to investigate, interpret, critique, and check the claims made about data presented in tables, pictographs, bar graphs, line graphs, and pie charts.	
Probability **Probability Investigations** engage in chance-based investigations, including those with not equally likely outcomes, by: – posing investigative questions – anticipating what might happen – identifying possible outcomes for the investigative questions – generating all possible ways to get each outcome (theoretical approach) or undertaking a probability experiment and recording the occurrences of each outcome – creating data visualisations for possible outcomes – describing what these visualisations show – finding probabilities as fractions – answering investigative questions – reflecting on anticipated outcomes	**P & A 6**
Critical Thinking in Probability agree or disagree with others' conclusions about chance-based investigations, with justification.	**P & A 6**
use the statistical processes to: – connect the chance of an outcome occurring with fractions, decimals, and percentages – investigate everyday chance-based situations using physical activities and technology.	